

WHAT IS CLAIMED IS

1. A bevel gear unit with continuous gearing adjustment and generating of axial contact pressure forces of the bevel gears upon a traction means, rotating between the bevel gears, via tensioning means arranged on the gear unit shafts, which exert forces in axial direction upon respectively one bevel gear that can be displaced axially along the respective gear unit shaft, wherein hydraulic tensioning means are provided on a first gear unit side for adjusting and maintaining the gear unit gearing and a spring supported tensioning means that is braced against a support, fixed relative to the shaft, is provided on the second gear unit side, wherein an axially fixed bevel gear and an axially movable bevel gear with an extended hub are jointly arranged on the second gear unit side, the bevel gears are rotationally connected and jointly rotate on their gear unit shaft and are coupled to said gear unit shaft via a contact pressure mechanism that depends on the rotational moment or the rotational moment and the gearing, the contact pressure mechanism consists of a cam sleeve that is fixedly connected to the shaft, a cam sleeve formed by the free end of the extended hub and roll bodies for transmitting the force, wherein said roll bodies are inserted between opposite arranged cam curves and rotate around the roll body axes extending in radial direction, relative to the gear unit shaft, said roll bodies are guided by rings, are held at a mutual distance to each other in the axial center region between the cam sleeves with the aid of a spring that is arranged coaxial on the extended hub.

2. A bevel gear unit according to claim 1,

characterized in that

the bevel gears are arranged on a hollow shaft, which is positioned on the gear unit shaft, such that it can rotate but cannot be displaced in axial direction, that the axially fixed bevel gear is rigidly connected to the hollow shaft, that the axially movable bevel gear is connected to the hollow shaft so as to rotate along and that the cam sleeve that is fixedly connected to the shaft is arranged next to the hollow shaft on the gear unit shaft, such that it can rotate along and cannot be displaced, at least not in axial direction away from the opposite arranged cam sleeve.

3. A bevel gear unit according to claim 2,

characterized in that

the axially fixed bevel gear forms one piece with the hollow shaft.

4. A bevel gear unit according to claim 1,

characterized in that

the roll bodies engage in corresponding recesses on the rings with the aid of pinions that are coaxial to their rotational axes and project in radial direction relative to the gear unit shaft from the roll bodies.

5. A bevel gear unit according to claim 4,

characterized in that

a holding ring is arranged in radial direction coaxial to the gear shaft, either inside or outside of the roll bodies, and that the pinions on the roll bodies are positioned so as to

rotate inside holding ring bores, extending in radial direction relative to the gear unit shaft.

6. A bevel gear unit according to claim 4,
characterized in that

in radial direction relative to the gear unit shaft, a guide ring in the form of a hollow-cylindrical sleeve is arranged outside of the roll bodies, which guide ring encloses these roll bodies and the extended hub, that the guide ring can be displaced in axial direction along the extended hub, but is positioned such that it cannot rotate relative to this hub, that the outward projecting pinions on the roll bodies are positioned such that they can rotate in circumferential slots of the guide ring that extend along a radial plane of the gear unit shaft, which slots have an axial width corresponding to the diameter of the pinions and are held in the region of the axial center between the cam sleeves, that in circumferential direction, the length of the circumferential slots corresponds to at least half the maximum mutual circumferential path for the cam sleeves of the contact pressure mechanism and that the guide ring end facing the axially movable bevel gear is formed as extension onto the spring, such that moving in the same direction, it respectively traverses essentially half the axial distance traversed by the movable bevel gear.

7. A bevel gear unit according to claim 6,
characterized in that

the spring is supported on one side counter to the axially movable bevel gear and on the other side counter to the cam sleeve that is fixedly connected to the shaft.

8. A bevel gear unit according to claim 6,

characterized in that

the spring is essentially a disk spring assembly, one half of which is arranged on the hub and the other half on the guide ring, that the spring is supported counter to the cam sleeve via a hollow-cylindrical intermediate segment that encircles the guide ring and that the guide ring with radially outward pointing collar on the end is captured between the two halves of the disk spring assembly.

9. A bevel gear unit according to claim 6,

characterized in that

on the guide ring section located on the hub, the guide ring is provided with at least one groove that extends parallel to the axis of the gear unit shaft, in which a pin that is supported by the hub engages to prevent rotation.

10. A bevel gear unit according to claim 4,

characterized in that

outside of the roll bodies and in radial direction relative to the gear unit shaft, a guide ring that encompasses the roll bodies is arranged in the form of at least one assembly of axially side-by-side arranged, ring-shaped corrugated springs, having reciprocal undulations in axial direction along the circumference, that this guide ring is captured in axial direction between a rotating collar supported by the hub and a collar supported by the cam sleeve that is fixedly connected to the shaft and is kept axially centered relative

to the contact pressure mechanism, and that radially outward projecting pinions on the roll bodies are positioned rotating in the axial center of said guide ring.

11. A bevel gear unit according to claim 10,

characterized in that

the guide ring consists of two identical corrugated spring assemblies, arranged axially side-by-side, that the corrugated springs of each assembly are braced against each other by means of the undulation peaks that face each other and are fixedly connected, and that the pinions on the roll bodies are positioned such that they can rotate between the corrugated spring assemblies.

12. A bevel gear unit according to claim 11,

characterized in that

the holding ring is arranged outside of the roll bodies, between these roll bodies and the guide ring of the corrugated springs, and that the holding ring is provided with a rotating collar that projects at the center radially outward from the holding ring and engages between the corrugated spring assemblies.

13. A bevel gear unit according to claim 12,

characterized in that

the bores in the holding ring, which are designed to accommodate the pinions on the roll bodies, also extend through the collar.

14. A bevel gear unit according to claim 12,
characterized in that
the axial width of the collar corresponds to the width of the roll body pinions.

15. A bevel gear unit according to claim 10,
characterized in that
the spring is arranged on the hub and is braced against the axially movable bevel gear as
well as the cam sleeve that is fixedly connected to the shaft with the aid of an essentially
hollow-cylindrical intermediate segment that encompasses the guide ring.

16. A bevel gear unit according to claim 15,
characterized in that
the collar supported by the cam sleeve, which is fixed relative to the shaft, and the
intermediate segment are combined to form one component.

17. A bevel gear unit according to claim 1, wherein the hydraulic tensioning means us
the associated axially displaceable bevel gear as bottom for a pressure cylinder connected
to the bevel gear, which pressure cylinder forms together with a piston that is fixed
relative to the shaft a pressure chamber to which a pump supplies a pressure medium,
taken from a pressure medium supply via a pressure medium supply line for maintaining
and adjusting a gear unit gearing in a manner determined by a control valve,
characterized in that

a reversing valve is arranged inside the pressure medium supply line and that via the reversing valve, the pressure chamber can be connected to the pressure medium supply or the intake side of a pressure medium pump.

18. A bevel gear unit according to claim 17,
characterized in that
the reversing valve can be activated by the control for the control valve.

19. A bevel gear unit according to claim 17,
characterized in that
the reversing valve can be activated by the pressure existing inside the pressure medium intake line.